

## Ana Širović

EDUCATION

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**Ph.D. Oceanography, 2006***Scripps Institution of Oceanography, University of California San Diego*

Dissertation title: "Blue and fin whale acoustics and ecology off Antarctic Peninsula"

**B.A. Creative Studies – Biology, 2000***College of Creative Studies, University of California Santa Barbara*PROFESSIONAL EXPERIENCE

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<b>Associate Professor</b>	2021 – current
<i>Biology Department, Norwegian University of Science and Technology (NTNU), Trondheim, Norway.</i>	
<b>Associate Professor</b>	2018 – 2021
<i>Marine Biology Department, Texas A&amp;M University Galveston, Galveston, TX, USA.</i>	
<b>Associate Research Oceanographer</b>	2018
<b>Assistant Research Oceanographer &amp; Lecturer</b>	2012 – 2018
<b>Visiting Assistant Research Oceanographer</b>	2011 – 2012
<i>Scripps Institution of Oceanography, University of California San Diego, La Jolla, CA, USA.</i>	
<b>Assistant Professor</b>	2008 – 2010
<i>Department of Environmental Science, Alaska Pacific University, Anchorage, AK, USA.</i>	
<b>Postdoctoral Scholar</b>	2007 – 2008
<i>Southwest Fisheries Science Center, NOAA Fisheries Service, La Jolla, CA, USA.</i>	
<b>Lecturer</b>	2007
<i>University of San Diego, San Diego, CA, USA.</i>	
<b>Postdoctoral Researcher</b>	2006
<b>Graduate Research Assistant</b>	2000 – 2006
<i>Scripps Institution of Oceanography, University of California San Diego, La Jolla, CA, USA.</i>	

PUBLICATIONS

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<sup>^</sup> marks undergraduate student author, \* graduate student author, # postdoctoral scholar author

PEER-REVIEWED ARTICLES

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- Miller, BS, S Calderan, R Leaper, EJ Miller, A Širović, KM Stafford, E Bell, MC Double. 2021. Source level of Antarctic blue and fin whale sounds recorded on sonobuoys deployed in deep-ocean off Antarctica. *Frontiers in Marine Science*, **8**: 792651.
- \*Waddell, EE, #JH Rasmussen, A Širović. 2021. Applying artificial intelligence methods to detect and classify fish calls from the northern Gulf of Mexico. *Journal of Marine Science and Engineering*. **9**: 1128
- \*Carbaugh-Rutland, A, #JH Rasmussen, B Sterba-Boatwright, A Širović. 2021. Geographically distinct blue whale song variants in the Northeast Pacific. *Endangered Species Research*, **46**: 19-33.
- Rice, A, AJ Debich, A Širović, EM Oleson, JS Trickey, LM Varga, SM Wiggins, JA Hildebrand, S Baumann-Pickering. 2021. Cetacean occurrence off Washington from long-term passive acoustic monitoring. *Marine Biology*, **168**:136.

- Madhusudhana, S, Y Shiu, H Klinck, E Fleishman, X Liu, EM Nosal, T Helble, D Cholewiak, D Gillespie, A Širović, MA Roch. 2021. Improve detection of call sequences with temporal context. *Royal Society Interface*, **18**: 20210297.
- \*Pagniello, CMLS, #J Butler, A Sherwood, ^A Rosen, PLD Roberts, PE Parnell, JS Jaffe, A Širović. 2021. An optical imaging system to capture images in low-light aquatic habitats using only ambient light. *Oceanography*, **34**(3), 71-77.
- #Rasmussen, JH, A Širović. 2021. Using convolutional neural networks for automatic detection and classification of baleen whale social calls. *Journal of the Acoustical Society of America*, **149**:3635.
- Rice, A, A Širović, JS Trickey, AJ Debich, RS Gottlieb, SM Wiggins, JA Hildebrand, S Baumann-Pickering. 2021. Cetacean occurrence in the Gulf of Alaska from long-term passive acoustic monitoring. *Marine Biology*, **168**:72.
- #Butler, J, CMLS Pagniello, JS Jaffe, PE Parnell, A Širović. 2021. Diel and seasonal variability in kelp forest soundscapes off the Southern California coast. *Frontiers in Marine Science*.
- Širović, A, K Evans, C Garcia-Soto, JA Hildebrand, SM Jesus, JH Miller. 2021. Chapter 20: Trends in inputs of anthropogenic noise into the marine environment. *United Nations World Ocean Assessment Report 2*, vol 2, pp. 297-320.
- Miller, BS, **IWC-SORP/SOOS Acoustic Trends Working Group**<sup>1</sup>, N Balcazar, S Nieukirk, EC Leroy, M Aulich, FW Shabangu, RP Dziak, WS Lee, JK Hong. 2021. An open access dataset for developing automated detectors of Antarctic baleen whale sounds and performance evaluation of two commonly used detectors. *Scientific Reports*, **11**:806.
- \*Warren, VE, A Širović, C McPherson, KT Goetz, R Constantine. 2021. Spatio-temporal distribution of pygmy and Antarctic blue whales around central New Zealand, via passive acoustic monitoring. *Frontiers in Marine Science*, **7**:575257.
- Calderan, S, R Leaper, P Olson, TA Branch, A Širović, B Miller, N Kelly, JA Jackson. 2020. South Georgia blue whales five decades after the end of whaling. *Endangered Species Research*, **43**: 359-373.
- \*Filun, D, K Tomisch, T Brey, O Boebel, A Širović, S Spiesecke, I Van Opzeeland. 2020. Frozen verses: Antarctic minke whales (*Balaenoptera bonaerensis*) call predominately during austral winter. *Royal Society Open Science*, **7**: 192112.
- \*Szesciorka, AR, LT Ballance, A Širović, A Rice, MD Ohman, JA Hildebrand, and PJS Franks. 2020. Timing is everything: Drivers of interannual variability in blue whale migration. *Scientific Reports*, **10**: 7710.
- \*Wilson, KC, BX Semmens, CV Pattengill-Semmens, C McCoy, A Širović. 2020. Potential for grouper acoustic competition and partitioning at a multispecies spawning site in Little Cayman, Cayman Islands. *Marine Ecology Progress Series*, **634**: 127-146.
- \*Lewis, LA, J Calambokidis, AK Stimpert, J Fahlbusch, AS Friedlaender, MF McKenna, SL Mesnick, EM Oleson, BL Southall, AR Szesciorka, A Širović. 2018. Context-dependent variability in blue whale acoustic behaviour. *Royal Society Open Science*, **5**: 180241. doi: 10.1098/rsos.180241.
- \*Lewis, LA, A Širović. 2018. Variability in blue whale acoustic behavior off Southern California. *Marine Mammal Science*, **34**: 311-329. doi: 10.1111/mms/12458.
- Davis, G, MF Baumgartner, J Gurnee, J Bell, C Berchok, J Bort Thornton, S Brault, G Buchanan, RA Charif, D Cholewiak, C Clark, P Corkeron, J Delarue, K Dudzinski, L Hatch, JA Hildebrand, L Hodge, H Klinck, S Kraus, B Martin, D Mellinger, H Moors-Murphy, S Nieukirk, D Nowacek, S Parks, A Read, AN Rice, D Risch, A Širović, M Soldevilla, K Stafford, J Stanistreet, E Summers,

<sup>1</sup> The IWC-SORP/SOOS Acoustic Trends Working Group: S Buchan, D Harris, K Findlay, B Miller, F Samaran, A Širović, KM Stafford, I Van Opzeeland

- S Todd, A Warde, S van Parijs. 2017. Long-term passive acoustic recordings track the changing distribution of North Atlantic right whales (*Eubalaena glacialis*) from 2004 to 2014. *Scientific Reports*, **7**: 13460.
- Širović, A, EM Oleson, \*J Buccowich, A Rice, A Bayless. 2017. Fin whale song variability in southern California and the Gulf of California. *Scientific Reports*, **7**: 10126.
- Rice, A, VB Deecke, JKB Ford, JF Pilkington, EM Oleson, JA Hildebrand, A Širović. 2017. Spatial and temporal occurrence of killer whale ecotypes off the outer coast of Washington. *Marine Ecology Progress Series*, **572**: 255-268.
- Širović, A, JA Hildebrand, MA McDonald. 2016. Ocean ambient sound south of Bermuda and Panama Canal traffic. *Journal of the Acoustical Society of America*, **139**: 2417-2423.
- Guass, O, LM Haapanen, SE Dowd, A Širović, R McLaughlin. 2016. Analysis of the microbial diversity in the fecal material of the endangered blue whale, *Balaenoptera musculus*. *Antonie van Leeuwenhoek Journal of Microbiology*, **109**: 1063-1069.
- Dominello, T, A Širović. 2016. Seasonality of Antarctic minke whale (*Balaenoptera bonaerensis*) calls off the Western Antarctic Peninsula. *Marine Mammal Science*, **32**: 826-838.
- Roch, MA, H Batchelor, S Baumann-Pickering, CL Berchok, D Cholewiak, E Fujioka, EC Garland, S Herbert, JA Hildebrand, LM Munger, EM Oleson, S Van Parijs, D Risch, A Širović, MS Soldevilla. 2016. Management of acoustic metadata for bioacoustics. *Ecological Informatics*, **31**: 122-135.
- Širović, A. 2016. Variability in the performance of the spectrogram correlation detector for Northeast Pacific blue whale calls. *Bioacoustics*, **25**: 145-160.
- \*Nichols, TA, TW Anderson, A Širović. 2015. Intermittent noise induces physiological stress in a coastal marine fish. *PLoS One*, **10**(9): e0139157.
- Širović, A, A Rice, ^E Chou, SM Wiggins, JA Hildebrand, MA Roch. 2015. Seven years of blue and fin whale call abundance in Southern California. *Endangered Species Research*, **28**: 61-76.
- Širović, A, SC Johnson, LK Roche, LM Varga, SM Wiggins, JA Hildebrand. 2015. North Pacific right whales (*Eubalaena japonica*) recorded in the Northeastern Pacific Ocean in 2013. *Marine Mammal Science*, **31**: 800-807.
- Oleson, EM, A Širović, AR Bayless, JA Hildebrand. 2014. Synchronous seasonal change in fin whale song in the North Pacific. *PLoS One*, **9**(12): e115678.
- Širović, A, HR Bassett, SC Johnson, SM Wiggins, JA Hildebrand. 2014. Bryde's whale calls recorded in the Gulf of Mexico. *Marine Mammal Science*, **30**: 399-409.
- Širović, A, SM Wiggins, EM Oleson. 2013. Ocean noise in the tropical and subtropical Pacific Ocean. *Journal of the Acoustical Society of America*, **134**: 2681-2689.
- \*Kendall LS, A Širović, EH Roth. 2013. Effects of construction noise on the Cook Inlet beluga whale (*Delphinapterus leucas*) vocal behavior. *Canadian Acoustics*, **41**(3): 3-13.
- Širović, A, L Williams, SM Kerosky, SM Wiggins, JA Hildebrand. 2013. Temporal separation of two fin whale call types across the eastern North Pacific. *Marine Biology*, **160**: 47-57.
- Kerosky, SM, A Širović, LK Roche, S Baumann-Pickering, SM Wiggins, JA Hildebrand. 2012. Bryde's whale seasonal range expansion and increasing presence in the Southern California Bight from 2000 to 2010. *Deep-Sea Research I*, **65**: 125-132.
- Širović, A, JA Hildebrand. 2011. Using passive acoustics to model blue whale habitat off the Western Antarctic Peninsula. *Deep-Sea Research II*, **58**: 1719-1728.
- Širović, A, DA Demer. 2009. Sounds of captive rockfishes. *Copeia*, **2009**: 502-509.
- Širović, A, GR Cutter, JL Butler, DA Demer. 2009. Rockfish sounds and their potential use for population monitoring in the Southern California Bight. *ICES Journal of Marine Science*, **66**: 891-990.

- Širović, A, JA Hildebrand, SM Wiggins, D Thiele. 2009. Blue and fin whale acoustic presence around Antarctica during 2003 and 2004. *Marine Mammal Science*, **25**: 125-136.
- Širović, A, JA Hildebrand, SM Wiggins. 2007. Blue and fin whale call source levels and propagation ranges in the Southern Ocean. *Journal of the Acoustical Society of America*, **122**: 1208-1215.
- Širović, A, JA Hildebrand, D Thiele. 2006. Baleen whales in the Scotia Sea during January and February 2003. *Journal of Cetacean Research and Management*, **8**: 161-171.
- Širović, A, JA Hildebrand, SM Wiggins, MA McDonald, SE Moore, D Thiele. 2004. Seasonality of blue and fin whale calls and the influence of sea ice in the Western Antarctic Peninsula. *Deep-Sea Research II*, **51**: 2327-2344.
- Thiele, D, ET Chester, SE Moore, A Širović, JA Hildebrand, AS Friedlaender. 2004. Seasonal variability in whale encounters in the Western Antarctic Peninsula. *Deep-Sea Research II*, **51**: 2311-2325.

#### BOOK CHAPTERS, PROCEEDINGS & COMMENTARIES

- Širović, A, EM Oleson. Accepted. The bioacoustics of blue whales – Global diversity and behavioral variability in a foraging specialist. In: *Ethology of baleen whales, the Mysticetes*. (eds: C.W. Clark, E.C. Garland). Springer.
- Širović, A, D Holcer. 2020. Ambient noise from seismic surveys in the southern Adriatic Sea. In: *The Montenegrin Adriatic Coast: Marine Biology Environment* (Eds. Joksimović, Đurović, Zonn, Kostianoy, Semenov). Springer, Berlin, Heidelberg.
- \*KC Wilson, BX Semmens, SR Gittings, C Pattengill-Semmens, and A Širović. 2019. Development and evaluation of a passive acoustic localization method to monitor fish spawning aggregations and measure source levels. *OCEANS 2019 MTS/IEEE SEATTLE*, Seattle, WA, USA, pp. 1-7. doi: 10.23919/OCEANS40490.2019.8962663
- Miller, BS, S Calderan, EJ Miller, A Širović, KM Stafford, E Bell, M Double. 2019. A passive acoustic survey for marine mammals conducted during the 2019 Antarctic voyage on Euphausiids and Nutrient Re-cycling in Cetacean Hotspots (ENRICH). *Proceedings of ACOUSTICS 2019: Australian Acoustical Society*. Cape Schanck, VIC, Australia, 10 pp.
- Širović A, LM Varga, EM Oleson. 2016. Long-term trends in ambient and anthropogenic noise in central and western Pacific Ocean. POMA – 4th International Conference on the Effects of Noise on Aquatic Life, Dublin, Ireland.
- \*Pagniello, C, S Wiggins, G D'Spain, JA Hildebrand, A Širović. 2016. Bryde's whale behavioral metrics in the Southern California Bight from acoustic array tracking. POMA – 4th International Conference on the Effects of Noise on Aquatic Life, Dublin, Ireland.
- Hastings, PA, A Širović. 2015. Soundscapes offer unique opportunities for studies of fish communities. *Proceedings of the National Academy of Sciences*, **112**: 5866–5867.
- Roch, MA, A Širović, S Baumann-Pickering. 2013. Detection, classification and localization of cetaceans by groups at the Scripps Institution of Oceanography and San Diego State University (2003-2013). In: *Detection, Classification, Localization of Marine Mammals using passive acoustics* (eds: O. Adam, F. Samaran). Dirac NGO, Paris, France. Pp. 27-52.

#### AWARDS

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- Medwin Prize for Acoustical Oceanography, Acoustical Society of America (2021)
- Antarctica Service Medal, U.S. Department of Defense (2004)

## TEACHING EXPERIENCE

### INSTRUCTOR OF RECORD

- Texas A&M University Galveston**, Galveston, TX 2018 – 2021
- *Upper-division courses*: Biology of Marine Mammals (with lab), Conservation and Fisheries in Greece
  - *Graduate courses*: Marine Bioacoustics (with lab), Special Topics: Marine Mammal Biology, Human Impacts in the Marine Environment
- University of California San Diego**, La Jolla, CA 2012 – 2018
- *Upper-division course*: Marine Biology Laboratory (co-taught)
  - *Graduate courses*: Marine Bioacoustics (co-taught), Marine Science, Economics and Policy: Marine Ecology
- Alaska Pacific University**, Anchorage, AK 2008 – 2010
- *Lower-division courses*: Marine Field Work (field class), Principles of Biology (with lab), Marine Natural History (field class), Survey of Marine Biology
  - *Upper-division courses*: Marine Bioacoustics (with lab), Ichthyology (field class)
  - *Graduate course*: Alaska Fisheries
- University of San Diego**, San Diego, CA 2007
- *Lower-division course*: Biology of Organisms

### WORKSHOP LEADERSHIP

- POGO-SCOR Visiting Fellowship** 2019  
*Bioacoustic analysis training workshop*, Blue World Institute, Mali Lošinj, Croatia

### GRADUATE STUDENT SUPERVISION

**Current advisor**: *Emily Waddell (Ph.D.-TAMUG)*, *Santiago Dominguez (M.S.-TAMUG)*, *Zoë Groenewoud (M.S.-NTNU)*

**Committee member**: *Diego Filun (PhD.)* – student at Alfred Wegner Institute/University of Bremen (Germany)

**Past thesis supervisor**: *Alex Carbaugh-Rutland, M.S. (TAMUG) 2020*. Geographically distinct B call variants in the Northeast Pacific blue whale population. *Katherine Cameron, Ph.D. (UCSD) 2019*. Passive acoustic methods for studying multispecies spawning aggregations in Little Cayman. *Leah Lewis, M.S. (UCSD) 2017*. Blue whale acoustic behavior in southern California. *Elizabeth Vu, Ph.D. (UCSD) 2015*. Baleen whale habitat modeling using passive acoustic recordings. *Lindsey Kendall, M.S. (APU) 2010*. Construction impacts on the Cook Inlet beluga whale (*Delphinapterus leucas*) at the Port of Anchorage Marine Terminal Redevelopment Project. *Nicole Ward, M.S. (APU) 2010*. Monitoring the efficacy of juvenile salmon (*Onchorhynchus* spp.) off-channel habitat restoration projects in southcentral Alaska.

**Past co-chair or committee member**: *Angela Szesciorka (UCSD, Ph.D.) 2021*. Blue whale ecology and behavior in a human-impacted marine ecosystem: insights from acoustics and animal-borne tags. *Leah Varga (UCSD, M.S.) 2016*. Tracking singing fin whales off Southern California. *Tye Nichols (SDSU, M.S.) 2014*. Effect of ship noise on stress levels in larval fish. *Jasmine Buccowich (UCSD, M.S.) 2014*. Fin whale song variability in the Southern California Bight, from 2008 through 2012.

**Internship supervisor**: *Camille Ollier (M.S., 2020)* – student at Université d'Aix-Marseille (France)

**Undergraduate student research supervisor**: students supervised at TAMUG: *Adrienne Ashe, Leah Bolgan, Cheyenne Guerrero, Skyler Langley, Jared (Nalu) Martin, Sarah McCarty, Ellie Vartic*; students supervised at UCSD: *Annette Brennan, Jasmine Buccowich, Emily Chou, Arina Favilla,*

*Odalys Garcia, Klayton Harmon, Nic Jeffress, Mukta Kelkar, Alan Mason, Annie Rosen, Angus Thies, Emily Wilson*; students supervised at APU: *Asia Beder, Amy Bower, Becca Frowine, Sandra Love*.

## PRESENTATIONS

### SELECTED INVITED PRESENTATIONS

- Širović, A. 2021. Understanding marine life through long-term passive acoustic time series (**Medwin Award presentation**). *Meeting of the Acoustical Society of America*. Seattle, WA, USA.
- Širović, A. 2021. Anthropogenic noise in the ocean & its impact on cetaceans (**keynote speaker**). *EMSO Time Series Conference: Observing Ocean Sound*. Las Palmas de Gran Canaria, Spain.
- Širović, A, M Baumgartner, M Wood, C Steffen, D McCauley, M Visalli. 2021. Using whale call detections in a multi-faceted tool to mitigate ship strike risk. *International Conference on Ecology and Transportation (ICOET) Virtual Conference*. (Delivered virtually)
- Širović, A. 2021. My life as a bioacoustician. *American Cetacean Society Corpus Christi Student Chapter Seminar Series*. Texas A&M University Corpus Christi. (Delivered virtually)
- Širović, A. 2020. Blue whale acoustics, behavior and ecology. *School of Marine and Atmospheric Sciences Lecture Series*. Stony Brook University. (Delivered virtually)
- Širović, A. 2020. Blue whale acoustics, behavior and ecology. *Oregon Institute of Marine Biology's Summer Seminar Series*. University of Oregon. (Delivered virtually)
- Širović, A, 2020. Use of acoustics for baleen whale conservation. (**guest lecture** in course on Conservation Ecology of Marine Mammals) University of Piran, Slovenia. (Delivered virtually)
- Širović, A, 2020. Deep-water ocean ambient sound across the northern hemisphere. *IWC Workshop on Advancing Efforts to Address Underwater Noise from Shipping*. (Delivered virtually)
- Širović, A, 2018. Acoustic ecology of southern California kelp forest & its fishes. *Biology Department seminar*, University of Victoria, Victoria, BC, Canada.
- Širović, A, 2017. Detection and classification of baleen whales. *Workshop on passive acoustic monitoring, Marine Mammal Conference*. Halifax, NS, Canada.
- Širović, A, 2017. Trends in ocean ambient noise across ocean basins. *Munk Centennial series: Ocean Acoustics, National Security, and Walter Munk, Scripps Institution of Oceanography*. La Jolla, CA.
- Širović, A, 2016. Sound approaches to managing endangered marine species. *Next in Science seminar series, Radcliffe Institute for Advanced Studies at Harvard University*. Boston, MA.
- Širović, A, 2016. Status of blue whales in the Eastern North Pacific and current threats: Insights from acoustics (**panelist**). *Southern California Marine Mammal Workshop*. Newport Beach, CA.
- Širović, A. 2015. Academic perspectives on ocean noise (**keynote address**). *Oceanoise 2015*. Vilanova i la Geltru, Spain.
- Širović, A. 2015. Blue and fin whale habitat use off Southern California based on acoustic data. *San Diego State University Biology seminar series*. San Diego, CA.
- Širović, A. 2014. Can you hear me now? Coping with an increasingly noisy ocean. *Birch Aquarium Perspectives on Ocean Science series*. San Diego, CA.
- Širović, A. 2013. Sounds of the Southern California Bight. *Birch Aquarium whale-watching volunteer training session*. La Jolla, CA.
- Širović, A, S Baumann-Pickering, J Buccowich, A Debich, SC Johnson, SM Kerosky, LK Roche, SM Wiggins, JA Hildebrand. 2013. Baleen whale calls in the Southern California Bight from 2009 to 2012. *Journal of the Acoustical Society of America*, **134**: 4175.
- Širović, A, 2013. Bioacoustics and animal diversity (**roundtable panelist**). *International Bioacoustics Congress*. Pirenopolis, Brazil.

- Širović, A, 2012. Name that Tune: Using sound to study marine mammals. *Southern California Marine Mammal Workshop*. Newport Beach, CA.
- Širović, A, DA Demer, SM Wiggins, JA Hildebrand. 2011. Long-term fish monitoring in the Southern California Bight. *Journal of the Acoustical Society of America*, **130**: 2499.
- Širović, A. 2011. Using sound to estimate rockfish abundance in the Southern California Bight. *Hatfield Marine Science Center seminar series*. Newport, OR.

#### SELECTED MEETING ABSTRACTS

- Širović, A**, K Frasier, D Holcer. 2020. Cetaceans and seismic surveys in the Southern Adriatic Sea. *Journal of the Acoustical Society of America* **148**: 2734.
- Wood, M, M Baumgartner, M Visalli, **A Širović**. 2020. Near real time passive acoustic monitoring in the Santa Barbara Channel. *Journal of the Acoustical Society of America* **148**: 2773.
- Širović, A**, M Wood, JD Warren, KM Stafford, B Miller. 2020. Mesoscale dynamics of blue and fin whales and Antarctic krill off East Antarctica. *Ocean Sciences Meeting*. San Diego, CA.
- \*Carbaugh-Rutland, A, ^A Favilla, and A Širović. 2019. Investigating fine scale frequency characteristics of Northeast Pacific blue whale B calls for population delineation. *Journal of the Acoustical Society of America* **146**: 2805.
- \*Waddell, EE, KE Frasier, JA Hildebrand, and A Širović. 2019. Automatic detection and classification of fish calls in the Northern Gulf of Mexico using energy detectors and a convolutional neural network. *Journal of the Acoustical Society of America* **146**: 3025.
- #Rasmussen, JH, and A Širović. 2019. Using Faster R-CNN for automatic detection of baleen whale social calls. *Journal of the Acoustical Society of America* **146**: 2985.
- Širović, A**, S Baumann-Pickering, JA Hildebrand, SM Wiggins. 2019. Ocean ambient sounds across the northern hemisphere. *5<sup>th</sup> International Conference on the Effects of Noise on Aquatic Life*, Den Haag, Netherlands.
- Širović, A**, S Baumann-Pickering, JD Warren. 2018. Predator-prey interactions in the Southern California Bight. *Journal of the Acoustical Society of America* **144**: 1921.
- Širović, A**, A Rice, L Reed, ^M Kelkar, #G Phillips, T Helble. 2018. Detection of blue whale D calls from long-term recordings in southern California. *8th International Workshop on Detection, Classification, Localization, and Density Estimation of Marine Mammals using Passive Acoustics*, Paris, France.
- Širović, A**, LA Lewis, #GT Phillips, A Szesciorka, J Calambokidis. 2018. Insights into blue and fin whale acoustic behavior from fixed passive acoustic recorder and tag data. *Ocean Sciences Meeting*, Portland, OR.
- \*Pagniello, C, #J Butler, G D'Spain, E Parnell, J Jaffe, **A Širović**. 2017. Soundscape fishing: Spatial variability in a low-frequency fish chorus in the southern California kelp forest. *Journal of the Acoustical Society of America* **142**: 2503.
- Širović, A**, M McDonald, NE Balcazar-Cabrera, S Buchan, S Cerchio, C Clark, G Davis, K Findlay, G Gagnon, N Kyo, E Leroy, J Miksis-Olds, B Miller, EM Oleson, T Pangerc, TL Rogers, F Samaran, Y Simard, KM Stafford, D Stevenson, H Sugioka, K Thomisch, JS Trpovich, G Truong, I Van Opzeeland, S Van Parijs, R Yoshida, RL Brownell Jr. 2017. Blue whale songs worldwide: an update. *22nd Biennial Conference on the Biology of Marine Mammals* pp. 248.
- Oleson, EM, **A Širović**. 2017. Fin whale song in the central and western Pacific: seasonality and variability may provide clues to population structure. *22nd Biennial Conference on the Biology of Marine Mammals* pp. 254.

- \*Szesciorka, A, **A Širović**, L Lewis, J Fahlbusch, N Harrison, B Southall, J Calambokidis. 2017. Medium-duration archival tags provide unique insights into baleen whale behavior. *22nd Biennial Conference on the Biology of Marine Mammals* pp. 162.
- Širović A**, J Patel, JA Hildebrand, S Friedman. 2017. Changes in fish sound production in the northern Gulf of Mexico over six years. *Journal of the Acoustical Society of America*, **141**: 3862.
- #Butler, J, JS Jaffe, E Parnell, **A Širović**. 2017. Who's making all that racket? Seasonal variability in kelp forest soundscapes. *Journal of the Acoustical Society of America* **141**: 3864.
- \*Cameron, KC, JS Jaffe, BX Semmens, CV Pattengill-Semmens, CM McCoy, **A Širović**. 2016. Passive acoustic monitoring to study spatiotemporal patterns and behavior at a multispecies grouper spawning site (*invited talk*). *12th International Congress on the Biology of Fish*, San Marcos, TX.
- Širović A**, EM Oleson, ^J Buccowich, A Rice. 2016. Fin whale song variability in Southern California and the Gulf of California. *Journal of the Acoustical Society of America*, **140**: 3296.
- \*Lewis, LA, J Calambokidis, JA Hildebrand, **A Širović**. 2016. Blue whale song sequencing off Southern California (*invited talk*). *Journal of the Acoustical Society of America*, **140**: 3295.
- Širović A**, A Rice, E Chou. 2015. Detection of blue whale calls in 7 years of data from Southern California. *7th International Workshop on Detection, Classification, Localization, and Density Estimation of Marine Mammals using Passive Acoustics*, La Jolla, CA.
- Širović A**, A Rice, E Chou, JA Hildebrand, MA Roch. 2014. Blue and fin whale habitat modeling using calls. *Ecology and Acoustics Meeting*, Paris, France.
- Širović A**, S Friedman, SC Johnson, JA Hildebrand. 2014. Changes in fish sound production in the Gulf of Mexico following the Deepwater Horizon oil spill. *Ocean Sciences Meeting*, Honolulu, HI.
- Širović A**, SM Kerosky, M Parsell, JA Hildebrand. 2013. Implementation of automatic detectors for blue and fin whale calls. *International Bioacoustics Congress*, Pirenopolis, Brazil.
- Širović A**, SM Kerosky, M Parsell, JA Hildebrand. 2013. Implementation of automatic blue whale call detectors to multi-year data sets. *6th International Workshop on Detection, Classification, Localization, and Density Estimation of Marine Mammals using Passive Acoustics*, St. Andrews, UK.
- Širović, A**, S Baumann-Pickering, A Deich, R Gottlieb, SC Johnson, SM Kerosky, LK Roche, A Solsona Berga, SM Wiggins, JA Hildebrand. 2013. Cetacean seasonality in the Gulf of Alaska from passive acoustic monitoring. *Alaska Marine Science Symposium*, Anchorage, AK.
- Širović, A**, 2012. Passive acoustic monitoring of baleen whales in the Southern Ocean. *SCAR Open Science Meeting*, Portland, OR.
- Širović, A**, LN Williams, SM Kerosky, SM Wiggins, JA Hildebrand. 2012. Temporal separation of fin whale calls across the eastern North Pacific. *Ocean Sciences Meeting*, Salt Lake City, UT.
- Širović, A**, LS Kendall. 2010. Cook Inlet beluga whale echolocations at the Port of Anchorage Expansion. *Journal of the Acoustical Society of America*, **127**: 2487.
- Širović, A**, JA Hildebrand. 2009. Habitat modeling of calling blue whales off the Western Antarctic Peninsula. *3<sup>rd</sup> GLOBEC Open Science Meeting*, Victoria, BC.
- Širović, A**, DA Demer. 2009. Bocaccio sounds in the Southern California Bight. *Journal of the Acoustical Society of America*, **125**: 2487.
- Širović, A**, GR Cutter, JL Butler, DA Demer. 2008. Using sounds of rockfishes for population monitoring in the Southern California Bight. *ICES Symposium on the Ecosystem Approach with Fisheries Acoustics and Complementary Technologies*, Bergen, Norway.



- Širović, A, JA Hildebrand, D Thiele, SE Moore, MA McDonald, SM Wiggins. 2006. Ecological importance of whale population decimation off Antarctic Peninsula. *EOS Transactions AGU*, 87(36), Ocean Sciences Meeting Supplement, Abstract OS36B-27.
- Širović, A, JA Hildebrand, MA McDonald, SE Moore, J Barlow. 2005. Using blue and fin whale call detections for density estimation. *2<sup>nd</sup> International Workshop on Detection and Localization of Marine Mammals using Passive Acoustics*, Monaco.
- Širović, A, JA Hildebrand, SM Wiggins, SE Moore, MA McDonald, D Thiele. 2005. Seasonality of blue and fin whale calls west of the Antarctic Peninsula in relation to sea ice concentrations. *5<sup>th</sup> Gordon Research Conference on Polar Marine Science*, Ventura, CA.
- Širović, A, JA Hildebrand, SM Wiggins, SE Moore, MA McDonald. 2004. Location and range of calling blue and fin whales off the Western Antarctic Peninsula. *Journal of the Acoustical Society of America*, **116**: 2607.

## PROFESSIONAL ACTIVITIES

### INVITED MEETING PARTICIPANT

- EMSO Time Series Conference 2021: keynote speaker. Gran Canaria, Spain, October 2021.
- Invited panelist at the International Conference on Ecology and Transportation (ICOET). Virtual meeting, September 2021.
- Invited panelist for press briefing at Fall 2020 AGU meeting: Listening to a quieter ocean in the pandemic. Dec 2020.
- NOAA Biologically Important Areas II Workshop. Virtual meeting, Dec 2020.
- International Whaling Commission (IWC) Scientific Committee meetings. Virtual meeting, May 2020. Nairobi, Kenya, May 2019. Bled, Slovenia, April 2018, May 2017 and Jun 2016 & San Diego, CA, May 2015.
- Workshop on development of International Quiet Ocean Experiment (IQOE) guidelines for ocean sound observation. Den Haag, The Netherlands, July 2019.
- Southern California Marine Mammal Workshop (SCMMW): Status of blue whales in the Eastern North Pacific and current threats. Newport Beach, CA, Feb 2016.
- Oceanoise 2015: keynote address and panelist in Soundscapes session. Vilanova i la Geltru, Spain, May 2015.
- International Bioacoustics Congress (IBAC): Roundtable on Bioacoustics and animal diversity. Pirenopolis, Brazil, Sept 2013.
- Southern California Marine Mammal Workshop (SCMMW): Using sound to study marine mammals. Newport Beach, CA, Feb 2012.
- Southern Ocean non-lethal Research Partnership (SORP) workshop organized by the Government of Australia. Sydney, Australia, Mar 2009.
- Southern Ocean GLOBEC-International Whaling Commission data synthesis. Norfolk, VA, Oct 2005.

### REVIEWER

**Special Issues Guest Editor:** *Frontiers in Marine Science*.

**Manuscripts:** *Aquatic Conservation*, *Arctic*, *Animal Behaviour*, *Bioacoustics*, *Deep-Sea Research*, *Endangered Species Research*, *ICES Journal of Marine Science*, *Journal of Marine Systems*, *Journal of the Acoustical Society of America*, *Journal of Mammalogy*, *Journal of Marine Policy*, *Marine Ecology Progress Series*, *Marine Mammal Science*, *Marine Policy*, *Methods in Ecology and Evolution*, *Northwest Science*, *PLoS One*, *Polarforschung*, *Proceedings of the National Academy of Sciences*, *Proceedings of the Royal Society B*, *Progress in Oceanography*, *Scientific Reports*.

**Panel review member:** Research Foundation Flanders (FWO), US National Science Foundation.

**Grant proposals:** Australian Antarctic Division, Australia's Marine National Facility, Fund for Scientific Research – FNRS Belgium, Hudson River Foundation, International Whaling Commission, Marine Science and Technology Foundation, National Geographic Society, National Science Foundation, North Carolina Sea Grant, NOAA Ocean Exploration and Research Program, North Pacific Research Board, Research Council of Norway, Research Foundation Flanders (FWO), Iceland Research Board.

**External dissertation reviewer:** Curtin University, University of the Azores.

**Abstracts and session organization:** Alaska Marine Science Symposium, Biennial Conferences on the Biology of Marine Mammals, Meetings of the Acoustical Society of America, Ocean Sciences Meeting, The 7<sup>th</sup> and 8<sup>th</sup> and 9<sup>th</sup> International Workshops on Detection, Classification, Localization, and Density Estimation.

#### COMMITTEE MEMBERSHIPS

Atlantic Scientific Review Group for NOAA Fisheries, 2020 – current.

Southern Ocean Research Partnership Acoustics Trends Working Group, 2016 – current.

Acoustic Metadata Standards Committee (under the auspices of ASA), 2016 – current.

Scientific Committee of the International Whaling Commission (invited participant), 2015 – current.

Detection and Classification Metrics Committee, 2015 – 2018.

ASA Animal Bioacoustics Technical Committee, 2010 – current.

#### ACADEMIC SERVICE

MARB Undergraduate Curriculum Committee, 2019 – 2021 (Chair).

MARB Faculty Advisory Board, 2019 – 2021.

TAMUG Research Advisory Council, 2019 – 2021.

TAMUG MARB-IDP Promotional Materials Committee, 2018 – 2019.

SIO Committee on Committees Nominating Committee – 2018.

SIO Educational Policy Committee, 2017 – 2018.

SIO Marine Operations Committee, 2014 – 2018.

SIO Editorial and Publications Committee, 2016 – 2017.

UC Ship Funds Proposal Review Committee, 2016.

SIO Researcher Series Committee, 2015.

Dive Control Board at APU, 2009 – 2011.

Institutional Review Board at APU, 2010.

Undergraduate Studies Committee at APU, 2009 – 2010.

APU institutional rep for National Academic Advising Association (NACADA), 2009 – 2010.

Multicultural Advisory/International Studies Committee at APU, 2008 – 2010.

APU/UAA Book of the Year Selection Committee, 2008 – 2009.

SCOPE (Scripps Community Outreach Program for Education), 2004 – 2006.

Ancient Mariners Committee at SIO, 2003 – 2006.

Surfside Committee at SIO, 2001 – 2003.

#### SOCIETY MEMBERSHIPS

Acoustical Society of America (ASA), The Oceanography Society, European Cetacean Society.

## AT-SEA AND FIELD EXPERIENCE

**GoJelly cruise**, Trondheimsfjorden, *R/V Gunnerus*: 2 days 2021.

**Acoustic mooring deployments**, Adriatic Sea, *R/V Naše more*: 1 day in 2018 and 2019.

**Acoustic mooring deployments**, Gulf of Mexico, *R/V Trident*: 2 days in 2019; 1 day in 2020.

**ENRICH voyage**, Southern Ocean, *R/V Investigator*: 46 days in 2019.

**Acoustic mooring deployments**, Southern California Bight, *R/V R.G. Sproul*: 1 day in 2016; 8 days in 2017; 4 days in 2018; *R/V Sally Ride*: 3 days in 2016 and 6 days in 2017; *R/V Bob and Betty Beyster* 1 day in 2020.

**Grouper Moon Project**, Little Cayman, Cayman Islands: 14 days in 2016, 5 days in 2017

**SIO 136 Marine Biology Lab**, Southern California Bight, *R/V New Horizon*: 1 day in 2014; *R/V R.G. Sproul*: 1 day each in 2015-2016, 2 days in 2017

**Blue and fin whale tagging**, Southern California Bight, *R/V Shearwater*: 3 days each year during 2012-2014, 10 days in 2015

**PIFSC Cetacean survey**, Central and Western Pacific Ocean, *NOAA Ship O.E. Sette*: 17 days in 2010

**Acoustic monitoring in Resurrection Bay**, Seward, AK, 3 days in 2010

**Beluga whale monitoring at the Port of Anchorage Expansion**, Anchorage, AK, 20 days in 2009

**Rockfish survey (COAST07)**, Southern California Bight, *NOAA Ship D.S. Jordan*: 27 days in 2007

**California Cooperative Oceanographic Fisheries Investigations (CalCOFI)**, Central California, *NOAA Ship D.S. Jordan*: 8 days in 2007

**Blue Whale Monitoring Program**, Bonney upwelling, VIC, Australia, 5 days in 2004

**Antarctic Slope Experiment (ANSLOPE)**, Ross Sea, *R/V N.B. Palmer*: 47 days in 2004

**UK GLOBEC** (British Antarctic Survey), Scotia Sea, *RRS J.C. Ross*: 47 days in 2003

**Southern Ocean GLOBEC**, West Antarctic Peninsula

*ARSV L.M. Gould*: 27 days in 2001 and 26 days in 2002

*R/V N.B. Palmer*: 41 days in 2001 and 42 days in 2002

**Southern California Offshore Range Experiment (SCORE)**, Tanner and Cortes Banks, CA

*R/V R.G. Sproul*: 8 days in 2000

*R/P FLIP & R/V R.G. Sproul*: 10 days in 2003